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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10 091,193	03 05 2002	Howard Hao Chen	YOR91999-0420-US2	6354

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EXAMINER
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TRAN, TAN N

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 02/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/091,193

Applicant(s)

CHEN ET AL.

Examiner

TAN N TRAN

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 05 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 15-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 05 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other

**DETAILED ACTION**

***Election/Restriction***

1. Applicant's election without traverse of Group I, claims 1-14 in Paper No. 7 is acknowledged.

**Information Disclosure Statement**

2. If applicant is aware of any relevant prior art, he/she requested to cite it on form PTO-1449 in accordance with the guidelines set forth in M.P.E.P.

**609.**

**Drawings**

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the second conductor level additionally comprises third high dielectric constant material disposed between the additional adjacent conductors as recited in claim 11 and at least one electrically conductive barrier material disposed between the third high dielectric constant material and additional adjacent conductors as recited in claim 13 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 11,13 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification does not disclose the second conductor level additionally comprises third high dielectric constant material disposed between the additional adjacent conductors as recited in claim 11.

The specification does not disclose at least one electrically conductive barrier material disposed between the third high dielectric constant material and additional adjacent conductors as recited in claim 13.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 10,11,13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 10, lines 1-4, what does applicant mean by "the at least one successive conductor level additionally comprises a second conductor level comprising additional adjacent conductors disposed above the first successive level"?

**Claim Rejections - 35 USC § 102**

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,2,4,8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Geffken et al. (5,339,212).

With regard to claims 1,4,8, Geffken et al. discloses a substrate 10; two or more adjacent aluminum conductors 14', disposed in at least one dielectric layer 28 formed over the substrate 10 and electrically isolated from each other, wherein each pair of adjacent aluminum conductors 14' is separated by a gap, and a first high dielectric constant material 16' formed in the gap between two adjacent aluminum conductors 14'. (Note lines 53-68, column 2, fig. 2 of Geffken et al.).

With regard to claim 2, Geffken et al. discloses at least one successive conductor comprising at least one conductor 22 is provided over the adjacent conductors 14', further comprising second high dielectric constant material 24,28 disposed between at least one of the

adjacent conductors 14' and the at least one successive conductor level 22. (Note lines 53-68, column 2, fig. 2 of Geffken et al.).

With regard to claim 9, Geffken et al. discloses the at least one successive conductor level comprises a first successive level comprising at least one conductive via 20 electrically coupled to at least one of the pair of metal lines 22. (Note fig. 2 of Geffken et al.).

With regard to claim 10, Geffken et al. discloses at least one successive conductor level additionally comprises a second conductor level 26 comprising additional adjacent conductors disposed above the first successive level 22. (Note figs. 2 of Geffken et al.).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3,7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geffken et al. (5,339,212) in view of Lee (5,903,493).

With regard to claims 3,7, Geffken et al. does not disclose the high dielectric constant material is selected from the group consisting of ferroelectrics, relaxors, paraelectrics, perovskites, pyrochlores, layer perovskites, or any material with a dielectric constant which is greater than 10; and at least one pair of adjacent conductors comprises a power supply line and a ground line.

However, Lee discloses a capacitor comprising a BST high dielectric constant material 24 having a dielectric constant which is greater than 10 and at least one pair of adjacent conductors comprises a power supply line and a ground line. (Note lines 24-37, column 4; lines 58-66, column 5 of Lee).

Therefore, it would have been obvious to one of ordinary skill in the art to form the Geffken et al.'s device having a capacitor comprising a BST high dielectric constant material having a dielectric constant which is greater than and at least one pair of adjacent conductors comprises a power supply line and a ground line such as taught by Lee in order to improve the breakdown voltage of a capacitor.

Claim 5,6,12,14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geffken et al. (5,339,212).

With regard to claims 5 and 12, Geffken et al. does not disclose a diffusion barrier material formed between the high dielectric constant material and the conductors.

~~However~~, it would have been obvious to one of ordinary skill in the art to form a diffusion barrier material between the high dielectric constant layer and the conductors in order to prevent the impurity diffuses to the dielectric layer or vice versa.

With regard to claim 6, Geffken et al. discloses a diffusion barrier material 18 is TiN. (Note lines 5-7, column 3, fig. 2 of Geffken et al.).

With regard to claim 14, Geffken et al. discloses all the claimed subject matter except for the gap is in the range 0.1 to 2.0 microns. However, it would have been obvious to one of ordinary skill in the art to form the gap is in the range 0.1 to 2.0 microns in order to routine experimentation and optimization.

### **Conclusion**

8. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Tan Tran whose telephone number is (703) 305-3362. The examiner can normally be reached on M-F 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for after final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TT

Jan 2003

*cc: Nathan Flynn*